

What is claimed is:

1 1. A method of fabricating a shape memory alloy into a free standing thin film
2 structure comprising the steps of placing within a vacuum a cleaned substrate,
3 depositing a sacrificial layer on the substrate,
4 sputtering an amorphous shape memory alloy and depositing the
5 sputtered alloy in a thin film onto the sacrificial layer,
6 applying a chemical etchant to the sacrificial layer for a time which is
7 sufficient to etch the layer away to leave the thin film in a structure which is
8 free standing from the substrate, heating the thin film to an annealing
9 temperature which is sufficient to crystallize the shape memory alloy, and
10 cooling the free standing thin film.

1 2. A method as in claim 1 and further characterized in that the step of
2 depositing the sacrificial layer comprises depositing a material which can be
3 removed by an etching process that does not cause damage to the amorphous
4 shape memory alloy.

1 3. A method as in claim 2 and further characterized in that the material is
2 selected from the group consisting of chromium and aluminum.

1 4. A method as in claim 1 and further characterized in that the sputtered alloy is
2 deposited in a thin film having a thickness in the range of of $\sim 1\mu\text{m}$ to $\sim 40\mu\text{m}$.

1 5. A method as in claim 1 and further characterized in that the step of
2 annealing by heating is carried out while the the thin film remains deposited
3 ~~onto the sacrificial layer.~~

1 6. A method of fabricating a shape memory alloy into a free standing thin film
2 structure comprising the steps of placing within a vacuum a cleaned substrate,
3 depositing a sacrificial layer on the substrate,
4 sputtering an amorphous shape memory alloy and depositing the

sputtered alloy in a thin film onto the sacrificial layer,
heating the thin film to an annealing temperature while the thin film
remains deposited on the sacrificial layer, the annealing temperature being
sufficient to crystallize the shape memory alloy, and
applying a chemical etchant to the sacrificial layer for a time which is
sufficient to etch the layer away to leave the thin film in a structure which is
free standing from the substrate.

7. A method as in claim 6 and further comprising the step of cooling the free
standing thin film.

8. A product made by the method of claim 1.

9. A product made by the method of claim 6.